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‘Gofert’ Blackcurrant

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The blackcurrant (*Ribes nigrum* L.) is an important small fruit crop cultivated commercially in moderate-temperature regions encompassing many countries of the world (Brennan, 2008; Kampuss and Strautina, 2004). The blackcurrant fruits have extraordinarily high ascorbic acid content (302% of the Recommended Daily Intake per 100 g fresh fruits); good levels of potassium, phosphorus, iron, and vitamin B_5; and a broad range of other essential nutraceauticals (Deighton et al., 2002; Gopalan et al., 2012; Karjalainen et al., 2009; Lister et al., 2002; Seeram, 2008). Poland, for many years, has been the top world producer and exporter of currants (mainly blackcurrants) with an annual production ranging from 180,000 to 220,000 metric tons (FAOSTAT, 2013; GUS, 2012). Also, Poland, besides the United Kingtom (Brennan and Graham, 2009), is one of the leading countries in the breeding of new blackcurrant cultivars (Pluta et al., 2012; Pluta and Broniarek-Niemiec, 2000; Pluta and Żurawicz, 2009).

Origin

‘Gofert’ was selected among seedlings received from the crossing of ‘Golubka’ × ‘Fertödi-1’ made at the Fruit Breeding Department of the Research Institute of Horticulture (formerly Research Institute of Pomology and Floriculture) in Skierniewice, Poland. Crossing of parental forms was made in 1987, and the seedling, from which the cultivar was originated, was selected in 1996. Both parental forms differ widely in terms of their pedigree, geographical origin, and many agronomic features. ‘Golubka’ (derivative of *Ribes dikuscha* Fisch. Ex Turcz.) coming from the cross of ‘Sanders’ × ‘Primorskij Champion’ was obtained in the Siberian region of Russia. It ripens early, produces small fruit (0.6 to 0.7 g), and is only of medium productivity. Its plants are susceptible to American gooseberry mildew (*Sphaerotheca mors-uvae* Schwein./Berk. et Curt.) and gall mite (*Cecidophyopsis ribis* West.) but are resistant to leaf spot (*Drepanopeziza ribis* Kleb. Petrak.) and white pine blister rust (*Cronartium ribicola* Fish.). ‘Golubka’ is also resistant to Blackcurrant Reversion Virus, and this is its main advantage in breeding and cultivation. ‘Fertödi-1’ (coming from *Ribes nigrum* var. *scandinavicum*) was bred in Hungary. It is an open-pollinated selection from the Finnish cultivar Aström, which is closely related to another Finnish cultivar, Brödtorp. The earliness and evenness of ripening as well as good taste of fruits and pretty high yields are the main advantages of ‘Fertödi-1’. However, its disadvantages are the high susceptibility of the plants to main fungal diseases such as powdery mildew, leaf spot, and white pine blister rust as well as a spreading plant habit. During the evaluation, ‘Gofert’ was tested as the selected breeding number PC-1. The name of ‘Gofert’ derives from initial letters of names of both parental forms (‘Golubka’ and ‘Fertödi-1’).

Performance

The cultivar trial was conducted from 2007 to 2010 at the Experimental Orchard at Dąbrowice, near Skierniewice, central Poland, belonging to the Research Institute of Horticulture. Besides ‘Gofert’, it included seven other cultivars (Table 1) of which well-adapted ‘Öjebyn’ and ‘Titania’ were used in studies as the standard cultivars. In fall of 2003, 1-year-old bushes of each cultivar were planted in single, adjacent rows of 250 m long. Bushes were spaced 3.50 m × 0.50 m apart. In each row, four completely randomized plots consisting of 50 bushes each were selected. In central Poland the bloom period of ‘Gofert’ is the end of April or beginning of May depending on the season/year, and it is an early-ripening cultivar. Harvest dates are early July, on average 1 d before ‘Öjebyn’ and ‘Titania’ (Table 1). Under Polish agro climatic conditions, ‘Gofert’ is very productive, bears fruits regularly, and is well suited to machine harvesting. In trials, fruits were picked by the Polish-made self-pulled harvester (type KPS-4B); an average fruit yield of over 10 t·ha^{-1} was achieved (Table 1). Yields were ≈60% more than ‘Öjebyn’ and ‘Titania’, used as the standard cultivars in this trial. An effectiveness of the mechanical harvest was almost as high as ‘Öjebyn’ and higher than ‘Titania’ (Table 1). During the last 17 years of observations in the climatic conditions of central Poland, the shrubs were unaffected by winter frosts, even when the air temperature dropped to –30 °C, and the flowers were rarely damaged by spring frosts.

Fruit Description

‘Gofert’ produces quite large berries (≈1.2 g) (Table 1) on medium-long strigs

Table 1. Ripening time, yielding, fruit size, and effectiveness of mechanical harvest of ‘Gofert’ in comparison with other blackcurrant cultivars (Research Institute of Horticulture in Skierniewice, central Poland, 2007–10).

Cultivar	Ripening date	Fruit yield (t·ha^{-1})	Fruit size (wt of 100 berries) (g)	Effectiveness of mechanical harvest (%)
	Avg for 2007–10			
Ojebyn	11 July	6.7 ab[z]	84.1 a	98.0 a[y]
Titania	11 July	6.5 a	112.4 d	95.6 a
Tisel	6 July	11.7 b	103.2 bc	98.2 a
Tiben	16 July	9.1 ab	96.4 b	97.3 a
Ores	15 July	7.1 ab	109.1 cd	96.9 a
Ruben	16 July	9.2 ab	124.1 e	96.0 a
Tines	11 July	7.5 ab	139.4 f	97.6 a
Gofert	10 July	10.4 ab	116.5 de	97.4 a

[z]Means within columns marked with the same letter do not differ significantly at $P = 0.05$ according to the Duncan’s multiple range.
[y]Calculated as percent of fruits harvested from the bushes.

Fig. 1. Fruiting bushes of ‘Gofert’ (left), leaf and strigs with fruits (right).

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(Fig. 1) as compared with 'Titania', but much larger than 'Öjebyn' (Table 1). The fruit is quite firm. The fruit chemical analyses were performed using 1.0-kg samples of fully matured fruit randomly collected from at least five bushes of the same genotype in a variety trial. Fruits were washed, sealed inside plastic bags, and frozen at –25 °C. Before analysis the samples were disintegrated in a frozen state and mixed thoroughly to obtain uniform material. In the case of organic and ascorbic acid determination, the frozen material was homogenized in 6% HPO_3 solution and after filtration analyzed by high-performance liquid chromatography using a Hewlett-Packard 1100 chromatograph equipped with two Supelco LC-18 25 columns in sequence. For the determination of anthocyanins, calculated as cyanidin-3-O-rutinoside/100 g of raw material, extinction coefficient for the calculation was 28,800 and molecular weight 595 (Kapasakalidis et al., 2006; Wrolstad, 1976). Contents of soluble solids, anthocyanins, titrable acidity, and ascorbic acid were analyzed in four consecutive seasons (2007–10) and average results are presented in this article. In comparison with both standard cultivars, the fruit of 'Gofert' is richer in soluble solids content (average 18%) (Fig. 2); however, the difference is not significant. Compared with both standard cultivars, 'Gofert' is much richer in ascorbic acid content (average 208 mg/100 g of raw material) (Fig. 3). The anthocyanin content (Fig. 4) and acidity content (Fig. 5) are generally medium, as they are in standard cultivars Öjebyn and Titania. The fruit of 'Gofert' is suitable for the fresh market because they are sweet and have a good flavor resulting from a desirable ratio of sugars and organic acids. They are also very suitable for all processing applications (concentrates, juices, jellies, frozen foods, and other high-quality fruit products) and for individual quick freezing.

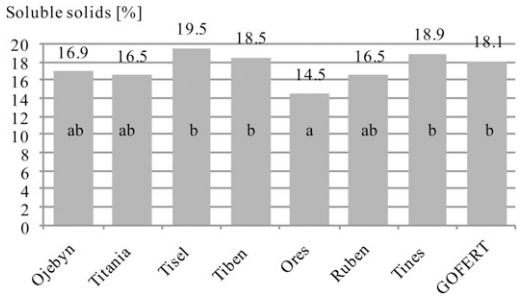

Fig. 2. Soluble solids content (%) in the fruit of 'Gofert' in comparison with other blackcurrant cultivars (Research Institute of Horticulture in Skierniewice, central Poland, 2007–10).

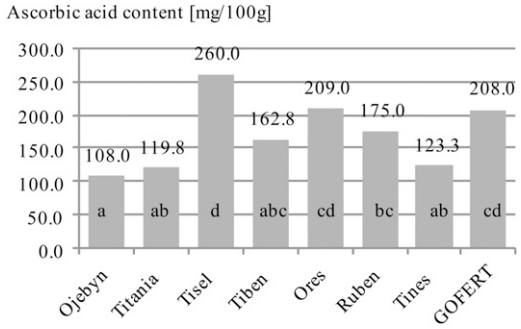

Fig. 3. Ascorbic acid content (mg/100 g) of 'Gofert' in comparison with other blackcurrant cultivars (Research Institute of Horticulture in Skierniewice, central Poland, 2007–10).

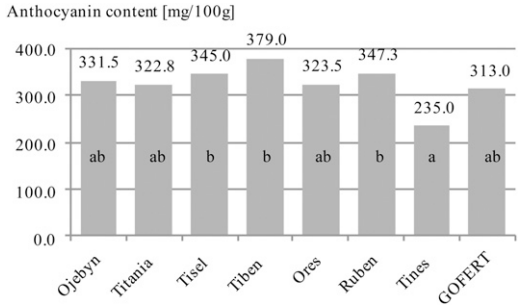

Fig. 4. Anthocyanin content (mg/100 g) in the fruit of 'Gofert' in comparison with other blackcurrant cultivars (Research Institute of Horticulture in Skierniewice, central Poland, 2007–10).

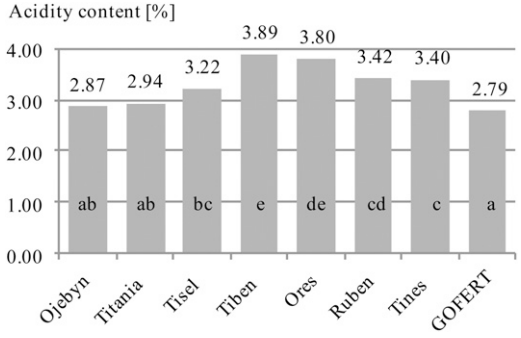

Fig. 5. Titrable acidity content (%) in the fruit of 'Gofert' in comparison with other blackcurrant cultivars (Research Institute of Horticulture in Skierniewice, central Poland, 2007–10).

Plant Description

The shoots are strong, medium thick, and numerous in the last year of the studies, reaching heights of ≈140 cm on average, significantly taller than 'Öjebyn' and significantly shorter than 'Titania' (Table 2). The bush has a tendency to spread out into interrows, similar to 'Öjebyn' but less than 'Titania' (Table 2). The total plant size of 'Gofert', expressed as the bush size index in m^2 (height × width of the bush), shows that 'Gofert' is more vigorous than 'Öjebyn' but is less vigorous than 'Titania' (Table 2). The plant buds are small and elongated, adhering to the shoots with a little anthocyanin color. Leaves are of medium size, five-lobed, light green, with an extended center lobe. The inflorescences are single and double and of medium length. The plants are highly resistant to powdery mildew and white pine blister rust and have low susceptibility to leaf spot (Table 2). However, in favorable weather conditions (dry and hot weather) of

Table 2. Some morphological traits and disease susceptibility of the 'Gofert' plants in comparison with other blackcurrant cultivars (Research Institute of Horticulture in Skierniewice, central Poland, 2007–10).

Cultivar	Plant ht (cm)	Plant width (cm)	Plant size index[y] (m^2)	American gooseberry mildew[x]	Leaf spot[x]	White pine blister rust[x]
	Avg for 2007–10					
Ojebyn	121.6 a[z]	200.3 ab	2.45 a	1.0 a[x]	3.0 b[x]	2.9 c[x]
Titania	148.2 e	228.7 c	3.41 c	1.0 a	2.8 ab	1.0 a
Tisel	137.7 cd	211.5 bc	2.93 b	1.0 a	2.8 ab	1.0 a
Tiben	144.3 de	218.5 bc	3.16 bc	1.0 a	2.9 ab	1.8 b
Ores	125.2 ab	187.5 a	2.33 a	1.0 a	2.5 ab	1.0 a
Ruben	134.5 bc	201.6 ab	2.73 ab	1.0 a	2.7 ab	1.0 a
Tines	131.0 abc	211.0 bc	2.79 ab	1.0 a	2.0 a	1.4 ab
Gofert	136.8 cd	203.2 ab	2.80 ab	1.0 a	2.5 ab	1.2 a

[z]Means within columns marked with the same letter do not differ significantly at $P = 0.05$ according to the Duncan's multiple range.

[y]Index calculated as plant height × plant width.

[x]One to 5 ranking scale, where 1 = no visible symptoms of infection, 3 = moderate infection, 5 = highest infection.

Poland, 'Gofert' shows medium susceptibility to aphid attacks, spider mite, and blackcurrant stem midge.

Availability

'Gofert' is admitted to the Polish National List of Fruit Plant Varieties by the Polish Research Center for Cultivar Testing (in Polish Centralny Ośrodek Badania Odmian Roślin Uprawnych) and in Europe is protected by the Community Plant Variety Rights in the territory of the whole European Union. At the end of 2012, the applications were submitted to the Canadian Food Inspection Agency for receiving plant breeder's rights in Canada (Application Number 12-7831) and to the U.S. Patent and Trademark Office in USA (Application Number: US 61/848,168). As of 2013, certified 'Gofert' plants were being propagated by the licensed nurseries in United States and Canada, the names of whom will be supplied on request. Growers and nurseries interested in cultivating or propagating this cultivar in the United States and Canada may contact Greg Quinn, Walnut Grove Farm, LLC, 59 Walnut Lane, Staatsburg, NY 12580; ghquinn@Currants.com.

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